Check List **5**(2): 238–242, 2009.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Mammalia, Chiroptera, Phyllostomidae, *Platyrrhinus recifinus*: first record in the state of Paraná, Southern Brazil

Carolina Scultori [1]
Daniela Dias [2]
Adriano Lúcio Peracchi [3]

[1] *Universidade Estadual de Campinas. Departamento de Botânica, Instituto de Biologia. Caixa Postal 6109. CEP 13083-970. Campinas, SP, Brazil. E-mail:* scultori@gmail.com

[2] *Fundação Oswaldo Cruz, Laboratório de Biologia e Parasitologia de Mamíferos Silvestres Reservatórios, IOC. Avenida Brasil, 4365, Manguinhos. CEP 21040-360. Rio de Janeiro, RJ, Brazil.*

[3] *Universidade Federal Rural do Rio de Janeiro, Instituto de Biologia, Laboratório de Mastozoologia. BR 465, km 7. CEP 23890-000. Seropédica, RJ, Brazil.*

The most recent revision of the genus *Platyrrhinus* Saussure, 1860 (Velazco 2005) recognized 14 species in the genus, most of them frugivorous. Five species are recorded in Brazil (Peracchi et al. 2006; Zortéa 2007): *Platyrrhinus brachycephalus* (Rouk and Carter 1972), *P. helleri* (Peters 1866), *P. infuscus* (Peters 1880), *P. lineatus* (E. Geoffroy 1810) and *P. recifinus* (Thomas 1901). *Platyrrhinus recifinus* is endemic to eastern Brazil, with its type locality in the city of Recife, state of Pernambuco, and also recorded in the states of Paraíba, Alagoas, Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo (Figure 1) (Zortéa 2007).

Almost nothing is known about the natural history of *P. recifinus*, but it is probably a frugivorous bat with habits similar to other congeneric species (Zortéa 2007). *Platyrrhinus recifinus* is found mainly in moist forests, such as primary and secondary forests in the Atlantic Forest (e.g. Peracchi and Albuquerque 1993, Dias et al. 2002, Tavares et al. 2007, Dias and Peracchi 2008), and the humid vegetation enclaves (*brejos de altitude*) in the Caatinga domain (Souza et al. 2004). The species is listed as "Vulnerable" on the Brazilian Threatened Species List, mainly due to destruction or fragmentation of its habitat (Machado et al. 2005).

Recently, however, *P. recifinus* appeared in the "Least Concern" category of the World Threatened Species List, because it has been captured in disturbed habitats, and thus is not considered to be a particularly threatened species (IUCN 2008). *Platyrrhinus recifinus* was not yet recorded in the state of Paraná (Reis et al. 2008), nor in any other state in southern Brazil (Peracchi et al. 2006). Therefore, the goal of the present study is to report the first record of this species to Paraná, thereby extending southward its known geographical distribution.

During a bat inventory study at *Reserva Natural Morro da Mina* (RNMM), an Atlantic Forest area in Paraná, five adult specimens of *P. recifinus* were collected, all of which were adults (completely ossified metacarpal epiphyses and phalanxes). Four bats were netted in tree-fall gaps from the understory to the canopy (about 20 m above the ground), on the trail known as *Trilha da Samambaia*, in Submontane Forest, and one was captured on the forest edge next to RNMM center. The nets were opened after sunset and kept opened until dawn. All collected individuals were preserved in 70 % alcohol and were deposited in the Mastozoological Collection of the *Museu de História Natural Capão da Imbuia* (MHNCI), in Curitiba, Paraná.

The *Reserva Natural Morro da Mina*, a Natural Patrimony Private Reserve, comprises an area of 3,400 ha and is located in the Antonina and Morretes municipalities (25°21' and 25°25' S, and 48°46' and 48°51' W; Figure 1). The reserve neighbors the Environmental Protection Areas of

Check List **5**(2): 238–242, 2009.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

the Serra do Mar and Guaraqueçaba, on the largest contiguous remnants of Atlantic Forest in Brazil (SOS Mata Atlântica and INPE 2008). The principal vegetation types, according to the classification of Veloso et al. (1991), are pioneer formations under marine and river-flooding influence, and the subformations of lowland, submontane, and dense, moist forests (Ferretti and Britez 2006). Systems of secondary vegetation occur as well. Thus, the reserve is now represented by a mix of initial, middle and advanced states of succession (M. Borgo personal communication). Following Köppen's classification, the climate of the region is Cfa, or mesothermic subtropical humid. The average annual temperature is between 20.8 and 22 ºC, with more than 2,000 mm of precipitation each year, falling principally from January to March (Ferretti and Britez 2006). The average air humidity is 85 %.

The first specimen (MHNCI 6098), a female, was captured on May 21st 2008, at 21:56 h, one meter above the ground. On May 23rd, 2008, two more females were captured: one (MHNCI 6099) at 18:10 h, one meter above the ground, and the other (MHNCI 6100) at 00:30 h, eight meters above the ground. An additional female (MHNCI 6101) was captured on June 25th, 2008, at 03:08 h, 16 m above the ground. The fifth individual (MHNCI 6102), a male, was captured on July 16th, 2008, at 00:05 h, six meters above the ground in a mist net placed in front of opened flowers of *Pseudobombax grandiflorum* (Cav.) A. Robins (Malvaceae), in a Submontane forest area, next to the Reserva center and highway PR-340. None of the individuals presented evidence of reproductive activity.

The identification of the collected individuals was based principally on the revision by Velazco (2005), which provided measurements and new useful characters for species differentiation. Identification was also aided by Sanborn (1955), Willig and Hollander (1987), Ferrel and Wilson (1991). For each specimen studied, we obtained six external measurements and 13 skull measurements (in mm) using a caliper of 0.02 mm precision and criteria proposed by Taddei et al. (1998).

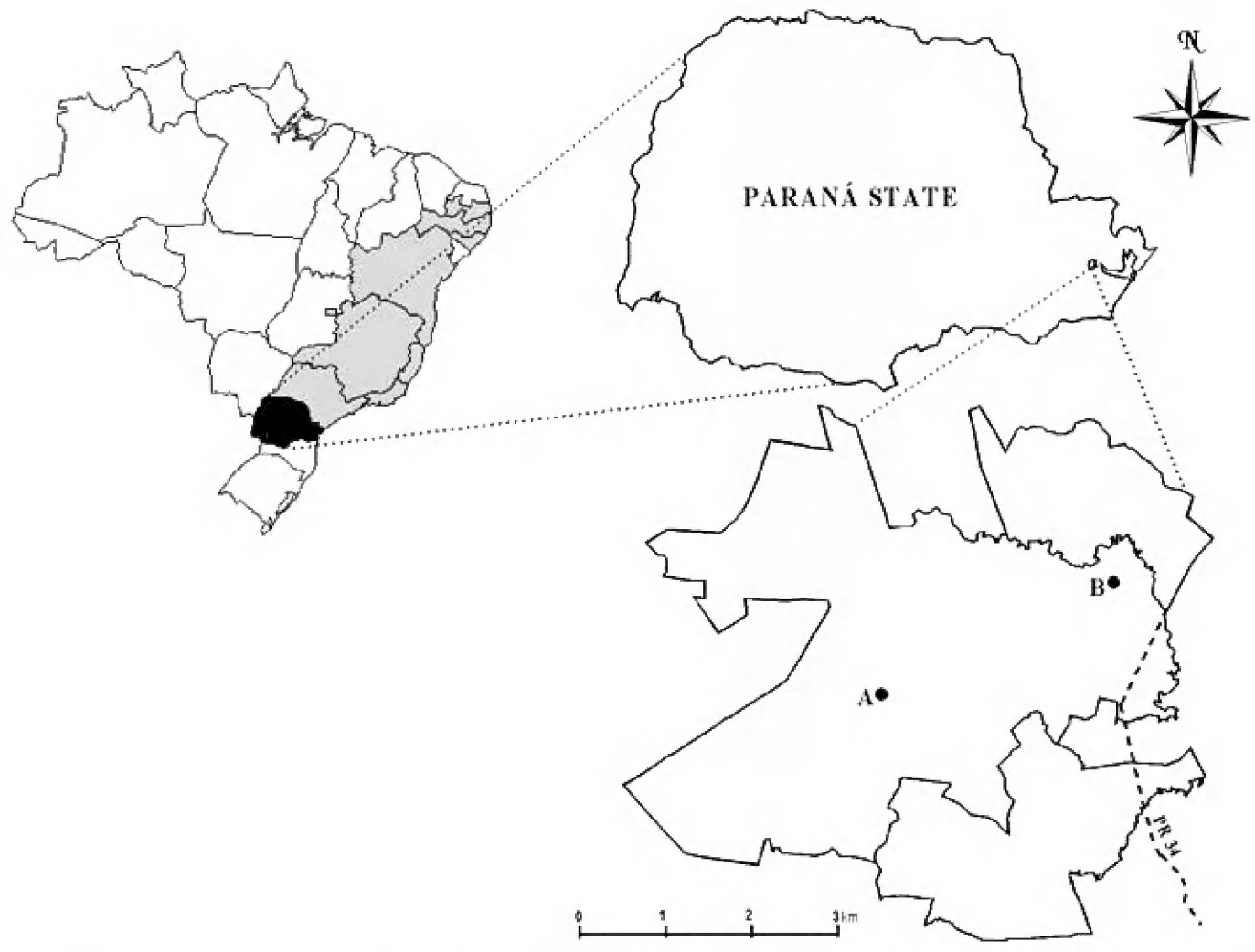

Figure 1. Map showing the *Reserva Natural Morro da Mina* and its location in the state of Paraná (black), and the currently known records (gray) for *Platyrrhinus recifinus* in the Brazil. (A) Submontane Forest where four *P. recifinus* were captured. (B) Edge of the forest where one individual was captured. Highway PR-340 next to the reserve in dotted line.

Check List **5**(2): 238–242, 2009.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

All specimens reported in this paper have the diagnostic features proposed by Velazco (2005) to *P. recifinus*: interramal vibrissae absent; dorsal fur tetracolored; a deep fossa in the hipoconal basin of the second upper premolar (P4) and a stylid cusp absent between the metaconid and the protoconid of first lower molar (m2). The specimens also have the features that distinguish *P. recifinus* from *P. lineatus* (Velazco 2005): third metacarpal longer than the fifth; postorbital and paraoccipital processes poorly developed; stylar cusp in lingual cingulum on the base of the first upper molar (M1) metacone absent, and first lower molar (m1) metaconid absent. *Platyrrhinus lineatus,* the other species in the genus recorded in Southern Brazil (Zortéa 2007; Weber et al. 2006), has one interramal vibrissae, dorsal fur tricolored, a shallow fossa on the hypoconal basin of P4, a stylid cusp present between the metaconid and the protoconid of m2, the fifth metacarpal longer than the third, postorbital and paraoccipital processes well developed, stylar cusp in lingual cingulum on the base of the M1 metacone present, and m1 metaconid present and well developed (Velazco 2005).

Carter and Dolan (1978), Willig and Hollander (1987), and Ferrel and Wilson (1991) mentioned trilobate lower incisors as an important character to separate *P. recifinus* from *P. lineatus* (bilobate incisors). In the specimens of *P. recifinus* from RNMM, the lower incisors are small, separated by gaps, and with the upper margin nearly smooth, with two or three rudimentary lobes. In *P. lineatus* the lower incisors are robust and clearly bilobate, with deep notches (D. Dias personal observation). According to Sanborn (1955) and Velazco (2005), size and disposition of the central upper incisors do not constitute good diagnostic characters, because a large degree of individual variation is present. Three specimens analyzed have the central upper incisors robust and separate from each other, and two have robust incisors connected on the extremity.

We initially had doubts about the identification of one individual (MHNCI 6099), which has forearm length measuring 45.96 mm, a value higher than the superior limit usually reported for *P. recifinus*, and inside the variation of *P. lineatus* (43.7 to 50.1 mm, Sanborn 1955). Analyses of the qualitative somatic and craniodental characters, however, confirm the identification of this specimen as *P. recifinus*. Because overlap of cranial measurements with *P. lineatus* has been reported in the literature (Dias et al. 2002; Velazco 2005; Dias and Peracchi 2008), these species are more easily distinguished by qualitative morphological characters.

There is little published measurement data for *P. recifinus* (Carter and Dolan 1978; Dias et al. 2002; Velazco 2005; Dias and Peracchi 2008). These specimens from Paraná reported herein are, in general, larger than the holotype from Pernambuco and specimens from the states of São Paulo and Rio de Janeiro, which may be related to a clinal variation (Table 1). Additional samples, however, are needed in order to obtain solid conclusions.

The specimens reported in this paper represent the first record of *P. recifinus* in Paraná and extend the known austral limit of the species' distribution. With this record, the bat list for Paraná is now represented by 61 species, complementing the most recent compilation published by Reis et al. (2008). However, present knowledge about the bat fauna of this state is far from being satisfactory. According to Miretzki (2003), about two thirds of the territory of Paraná is still insufficiently sampled. Although the *Reserva Natural Morro da Mina*, where the specimens of *P. recifinus* were captured, is located in a region considered of low priority for bat inventories (Miretzki 2003), our results come to reinforce others studies (e.g., Miranda et al. 2006, Gazarini and Bernardi 2007) that clearly indicate the need for continuing sampling efforts in this area.

Check List **5**(2): 238–242, 2009.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Table 1. Selected measurements of *Platyrrhinus recifinus* from the *Reserva Natural Morro da Mina*, *Reserva Biológica do Tinguá*, *Parque Estadual Pedra Branca*, localities in the state of São Paulo and from the holotype. Min = minimum; Max = maximum; N = number of specimens. Acronyms of measurements: total length of body (TL); ear length (EL); hind foot length (HL); length of forearm (FA); greatest length of skull, including incisors (GLS); condyloincisive length (CIL); basal length, including incisors (BL); palatal length, including incisors (PL); length of maxillary toothrow (MAXT); breadth across upper canines (BAC); breadth across upper molars (BAM); postorbital breadth (PB); zygomatic breadth (ZB); breadth of braincase (BB); mastoid breadth (MB); mandibular length (ML); and length of mandibular toothrow (MANT). Localities: [1] present study, [2] Velazco (2005), [3] Dias and Peracchi (2008), [4] Dias et al. (2002), [5] Carter and Dolan (1978).

	Reserva Natural Morro da Mina (Paraná) [1]	São Paulo [2]	Reserva Biológica do Tinguá (Rio de Janeiro) [3]	Parque Estadual da Pedra Branca (Rio de Janeiro) [4]	Holotype (Pernambuco)[5]
Characters	(Min-Max)	(Min-Max)	(Min-Max)	(Min-Max)	
	(N = 1 Ä; 4 Ā)	(N = 6)	(N = 3 Ä; 6 Ā)	(N = 2 Ä)	
TL	57.92 - 64.38	89.00 - 93.00	54.14 - 59.12	50.20 - 58.30	-
EL	15.30 - 16.86	18.00 - 20.00	16.1- 16.90	14.00 - 16.40	-
HL	11.84 - 13.44	11.00 - 13.00	10.5 - 13.54	9.20 - 10.50	-
FA	42.64 - 45.96	42.00– 43.00	41.66 - 43.54	41.70 - 42.00	40.20
GLS	24.56 - 25.50	23.03 - 23.76	23.50 – 25.24	23.90 - 24.20	24.10
CIL	22.36 - 23.42	21.99 – 22.61	22.04 - 22.98	21.60 - 22.00	21.70
BL	19.92 - 20.84	-	19.84 - 20.66	19.40 - 19.80	-
PL	11.88 - 12.76	-	11.74 - 12.40	11.30 - 11.60	-
MAXT	9.20 - 9.72	8.62 – 9.39	9.00 - 9.56	8.70- 8.80	8.90
BAM	10.72 - 11.44	9.90 – 10.71	10.28 - 10.98	10.20 - 10.40	10.50
BAC	6.28 - 6.70	-	6.00 - 6.44	6.00 - 6.10	6.40
PB	5.84 - 6.02	5.46 – 6.10	5.54 – 6.24	5.50 - 5.70	5.60
ZB	14.58 - 14.98	13.55 - 14.45	13.74 - 14.64	13.80 - 14.10	14.00
BB	10.50 - 11.22	10.18 – 10.80	10.20 - 10.74	10.30 - 10.50	10.30
MB	12.08 - 12.60	11.57 – 12.41	11.76 - 12.12	11.70 - 12.30	11.70
ML	16.18 - 17.20	-	16.20 - 16.96	15.60 - 16.00	15.30
MANT	9.62 - 10.48	-	9.54 - 10.26	9.50 - 9.50	9.50

Acknowledgments

Our special thanks to *Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental* (SPVS) for the permission to conduct our research and for their help with field work logistics; to IBAMA and IAP for research authorizations (process #10004 and 10004-2; IAP 05/07); to Dra. Marlies Sazima for her supervision and support; to the *Programa de Pós-Graduação em Ecologia* of the *Universidade Estadual de Campinas*; to all who helped with the field work; to Dr. Isaac Passos de Lima for the elaboration of the map; to Dra. Margareth L. Sekiama, Dr. Marco A. R. Mello, Dr. Carlos Eduardo Lustosa Esbérard, and one anonymous reviewer for suggestions to the manuscript; to Graham Edward Wyatt for the English revision; Idea Wild and FAEPEX for the donation of equipment; FAPESP for Msc. scholarship concessioned to C. Scultori; CNPq and FAPERJ for grants to A. L.Peracchi.

Literature cited

Carter, D.C. and P. G. Dolan. 1978. Catalogue of type specimens of Neotropical bats in selected European Museums. Special Publications. The Museum, Texas Tech University 15: 1-136.

Dias, D. and A. L. Peracchi. 2008. Quirópteros da Reserva Biológica do Tinguá, estado do Rio de Janeiro, sudeste do Brasil (Mammalia: Chiroptera). Revista Brasileira de Zoologia 25(2): 333-369.

Check List **5**(2): 238–242, 2009.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Dias, D., A. L. Peracchi, and S. S. P. Silva. 2002. Quirópteros do Parque Estadual da Pedra Branca, Rio de Janeiro, Brasil (Mammalia, Chiroptera). Revista Brasileira de Zoologia 19 (Supl. 2): 113-140.

Ferrell, C. S. and D. E. Wilson. 1991. *Platyrrhinus helleri.* Mammalian Species 373: 1-5.

Ferretti, A. R. and R. M. Britez. 2006. Ecological restoration, carbon sequestration and biodiversity conservation: The experience of the Society for Wildlife Research and Environmental Education (SPVS) in the Atlantic Rain Forest of Southern Brazil. Journal for Nature Conservation 14: 249-259.

Gazarini, J. and I. P. Bernardi. 2007. Mammalia, Chiroptera, Molossidae, *Molossops neglectus*: First record in the State of Paraná, Brazil. Check List 3(2): 123-125.

Handley, C. O., Jr. and K. C. Ferris. 1972. Descriptions of new bats of the genus *Vampyrops*. Proceedings of the Biological Society of Washington 84 (60): 519-524.

IUCN. 2008. IUCN Red List of Threatened Species. Electronic Database accessible at: http://www.iucnredlist.org. Captured on September 2008.

Machado, A. B. M., C. S. Martins, and G. M. Drummond. 2005. Lista da fauna brasileira ameaçada de extinção: incluindo as listas das espécies quase ameaçadas e deficientes em dados. Belo Horizonte: Fundação Biodiversitas. 160 p.

Miranda, J. M. D., I. P. Bernardi, and F. C. Passos. 2006. A new species of *Eptesicus* (Mammalia: Chiroptera: Vespertilionidae) from the Atlantic Forest, Brazil. Zootaxa 1383: 57-68.

Miretzki M. 2003. Morcegos do Estado do Paraná, Brasil (Mammalia, Chiroptera): riqueza de espécies, distribuição e síntese do conhecimento atual. Papéis Avulsos de Zoologia 43(6): 101-138.

Peracchi, A. L., I. P. Lima, N. R. Reis, M. R. Nogueira, and H. Ortêncio-Filho. 2006. Ordem Chiroptera; p. 153-230 *In* N. R. Reis, A. L. Peracchi, W. A. Pedro, and I. P. Lima (ed.). Mamíferos do Brasil. Londrina: Editora da Universidade Estadual de Londrina.

Peracchi, A. L. and S. T. Albuquerque. 1993. Quirópteros do município de Linhares, Estado do Espírito Santo, Brasil (Mammalia, Chiroptera). Revista Brasileira de Biologia 53 (4): 575-581.

Reis, N. R., I. P. Lima, and M. Miretzki. 2008. Morcegos do Paraná; p. 125-142 *In* N. R. Reis, A. L. Peracchi, and G. A. D. Santos (ed.). Ecologia de Morcegos. Londrina: Technical Books Editora.

Sanborn, C. C. 1955. Remarks on the bats of the genus *Vampyrops*. Fieldiana 37: 403-413.

SOS Mata Atlântica and INPE. 2008. Atlas da Mata Atlântica. Electronic Database accessible at http://www.sosmatatlantica.org.br/index.php?section=atlas&action=atlas. Fundação S.O.S. Mata Atlântica, São Paulo, BR. Captured on September 2008.

Souza, M. A. N., A. Langguth, and E. A. Gimenez. 2004. Mamíferos dos brejos de altitude de Paraíba e Pernambuco; p. 229-254 *In* K. C. Porto, J. J. P. Cabral, and M. Tabarelli (org.). Brejos de altitude em Pernambuco e Paraíba: história natural, ecologia e conservação. Brasília: MMA/PROBIO/CEPAN.

Taddei, V.A., C. A. Nobile, and E. Morielle-Versute. 1998. Distribuição geográfica e análise morfométrica comparativa em *Artibeus obscurus* (Schinz, 1821) e *Artibeus fimbriatus* Gray, 1838 (Mammalia, Chiroptera, Phyllostomidae). Ensaios e Ciência 2(2): 71-27.

Tavares, V. C., F. A. Perini, and J. A. Lombardi. 2007. The bat communities (Chiroptera) of the Parque Estadual do Rio Doce, a large remnant of Atlantic Forest in southeastern Brazil. Lundiana 8 (1): 35-47.

Velazco, P. M. 2005. Morphological Phylogeny of the Bat Genus *Platyrrhinus* Sausssure, 1860 (Chiroptera: Phyllostomidae) with the Description of Four New Species. Fieldiana 105: 1-53.

Veloso, H. P., A. L. R. Rangel-Filho, and J. C. A. Lima. 1991. Classificação da vegetação brasileira adaptada a um sistema universal. Instituto Brasileiro de Geografia e Estatística, Departamento de Recursos Naturais e Estudos Ambientais, Rio de Janeiro.

Weber, M. M., N. C. Cáceres, D. O. Lima, V. L. Camilotti, C. Roman, and L. Telles Neto. 2006. Mammalia, Chiroptera, Phyllostomidae, *Platyrrhinus lineatus*: Range expansion to the state of Rio Grande do Sul, Brazil. Check List 2(3): 96-98.

Willig, M.R. and R.R. Hollander. 1987. *Vampyrops lineatus.* Mammalin Species 275: 1-4.

Zortéa, M. 2007. Subfamília Stenodermatinae; p. 107-128 In N. R. Reis, A. L. Peracchi, W. A. Pedro, and I. P. Lima (ed.). Morcegos do Brasil. Londrina: Editora da Universidade Estadual de Londrina.

Received January 2009
Accepted April 2009
Published online May 2009